



AF / 3729

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

CROWDER et al.

Serial No.: 09/975,593

Filed: October 10, 2001

Atty. File No.: 3123-379

For: "SUSPENSION SWAGE PLACE WITH
APPLIED SOLID FILM LUBRICANT
AND METHOD OF ASSEMBLING
THE SAME"Mail Stop Appeal Brief - Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

) Group Art Unit: 3729
)
) Examiner: Kim, P.
)
) RESPONSE TO NOTIFICATION OF NON-
) COMPLIANCE WITH 37 C.F.R. §1.192(c)

CERTIFICATE OF MAILING

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SHERIDAN ROSS P.C.

BY:

Christine Jaquet

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APR 15 2004

Dear Sir:

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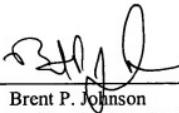
In response to the Notification dated April 1, 2004, Applicant encloses herewith in triplicate a complete new Brief which addresses the Examiner's concern regarding the Appeal Brief not containing a statement of the After Final Amendment. In Section IV of the Brief (Status of Amendments), a sentence has been added to indicate the Amendment After Final that was filed. It is also brought to the Examiner's attention that this Amendment After Final was originally included at Appendix B, and the Appeal Brief originally referenced the Amendment After Final at page 8. It is also noted that Appendix A of the Appeal Brief has been corrected so that the appealed claims incorporate the claim amendment made in the Amendment After Final.

Therefore, it is requested that the Notification of Non-Compliance be withdrawn, and the Appeal allowed to proceed.

The Examiner is urged to contact the undersigned if there are any further issues which would prevent the Appeal from moving forward.

Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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AND METHOD OF ASSEMBLING
THE SAME"

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313

Dear Sir:

Appellant submits this Amended and Supplemental brief in furtherance of the Appeal

Brief filed on January 6, 2004. The Notice of Appeal was filed on January 6, 2004.

This Amended and Supplemental Brief is amended under 37 CFR § 1.192(d) to the extent the original Brief can be considered not in compliance with 37 CFR § 1.192(c) for failing to state that claims 16 and 17 constitute a separate grouping of claims under Section VII of the Brief.

These claims were separately rejected by the Examiner; therefore, should inherently constitute a separate group. Accordingly, the Brief has been amended to recite claims 16 and 17 constitute a separate group and do not stand or fall with the other claims on appeal.

The Amended and Supplemental Brief has been supplemented by: (1) redrafting the argument for reversal of the rejection of claims 16 and 17, and (2) reciting dependant claim 14 as

) Group Art Unit: 3729
)
) Examiner: Kim, P.
)
) AMENDED AND SUPPLEMENTAL
) APPEAL BRIEF (37 C.F.R. §1.192)
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SHERIDAN ROSS P.C.

BY: Christine jacquet

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another group on appeal. The original Brief commented on allowability of Claim 14, but not within the context of claim 14 being a separate group on appeal. No fees are believed to be due with the filing of this Amended and Supplemental Appeal Brief; however, please charge any fees due to Deposit Account No. 19-1970. It is respectfully requested that this Amended and Supplemental Appeal Brief be entered in lieu of the original Appeal Brief.

This Amended and Supplemental Appeal Brief is being transmitted in triplicate pursuant to 37 C.F.R. §1.192(a).

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I. REAL PARTY IN INTEREST (37 C.F.R. §1.192(c)(1))

The real party in interest in this application is the assignee, Maxtor Corporation. An assignment, whereby the inventors assigned all rights in the above-referenced application to Maxtor Corporation, was recorded in the U.S. Patent and Trademark Office on January 4, 2002 at Reel No. 012427, Frame No. 0757. The terms "Appellant" and "Appellant" in this Appeal Brief mean Maxtor Corporation, unless otherwise indicated.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. §1.192(c)(2))

There are no related appeals or interferences.

III. STATUS OF THE CLAIMS (37 C.F.R. §1.192(c)(3))

The status of the claims in this application is as follows:

A. Total Number of Claims: 31

B. Status of Claims:

1. Claims canceled: 1-12 and 30.

2. Claims withdrawn from consideration but not canceled: claims 22-29 and

31. In a separate petition under Rule 1.144, Appellant has petitioned for reversal of the

Examiner's final restriction requirement with respect to this set of claims.

3. Claims pending: 13-29, and 31.

4. Claims allowed: none.

5. Claims rejected: 13-21.

C. Claims on Appeal: Claims 13-21, as set forth in Appendix A.

IV. STATUS OF AMENDMENTS (37 C.F.R. §1.192(c)(4))

An Amendment and Response was filed by a Certificate of Mailing on July 11, 2003 in response to the Office Action having a mailing date of May 28, 2003 (Paper No. 9). In response to this Amendment and Response, a Final Office Action was issued having a mailing date of October 6, 2003 (Paper No. 11). In this Final Office Action, claims 13-21 were rejected under 35 U.S.C. § 103. An Amendment After Final was filed on January 6, 2004, by a Certificate of Mailing in response to the final Office Action. A copy of this is attached hereto at Appendix B.

V. SUMMARY OF THE INVENTION (37 C.F.R. §1.192(c)(5))

The present invention is directed to a disk drive to include a method of assembling an actuator assembly, and a method of reducing torque out retention values between an actuator arm and a suspension arm. A desired lubricant is applied to metal parts of the actuator assembly which reduces potential contamination during swaging, and also helps to prevent damage to the actuator assembly in the event that the actuator assembly must be disassembled. (Page 4, lines 13-18, page 5, lines 4-9).

The surfaces that are preferably lubricated are those defined as the swage contact surfaces. Lubrication may be applied to an inner face 38 of the opening formed in the actuator arm, the outer surface of the swage boss 48, or both. (Page 10, lines 8-11). Various methods may be used to apply lubrication to include immersing the swage boss, spraying, or vacuum deposition. (Page 9, lines 9-29, page 10, lines 1-7). Coating the swage contact surfaces with a thin film lubricant also enhances the deformation characteristics of the swage boss, facilitates reduction in the retention torque, and provides better consistency in torque out retention values.

Each of these attributes contribute in reducing chipping and other potential material failure of the swage contact surfaces. (Page 10, lines 25-29).

VI. ISSUES

The issues on appeal are:

A. Whether Claims 13-15 and 18-21 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. (U.S. Patent No. 5,879,578); and

B. Whether Claims 16 and 17 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. in view of Fisher et al. (U.S. Patent No. 4,215,480).

VII. GROUPING OF CLAIMS

All of the pending claims on appeal do not stand or fall together. Instead, the claims are grouped as follows:

A. For the first issue, the claims are grouped as follows:

1. Claims 13, 15, and 18-21 (Group A); and
2. Claim 14 (Group B).

B. For the second issue, all of the claims rejected (16 and 17) constitute a separate group and stand or fall together.

C. Reasons why the claim groupings herein are separately patentable:

The independent claim in Group A is Claim 13. The other claims in Group A depend directly or indirectly from Claim 13. Claim 14 of Group B depends from Claim 13 and further recites the step of depositing a film lubricant on the opening in the distal end of the actuator arm prior to the attaching step (of Claim 13). In order to have this claim properly addressed on appeal, it deserves a separate grouping not only because of the claimed subject

matter therein, but also because the Examiner has yet to provide any reasons for the rejection of this claim. As for the subject matter of the claim, lubrication of the opening in the actuator arm further remedies the potentially harmful effects associated with the deformation of the swage boss during swaging. Claim 14 adds yet another distinct type of lubrication step because lubrication is provided directly on an additional part of the actuator (the actuator arm), whereas Claim 13 only requires lubrication on the outer surface of the swage boss. Accordingly, Claim 14 should be considered as a separate group on appeal.

VIII. ARGUMENTS

A. Claims 13-15 rejected under §103 as being unpatentable over Chung et al.

To establish a prima facie case of obviousness under 35 U.S.C. §103(a), the Examiner must show that: (1) the references teach all of the elements of the claimed invention, (2) the references contain some teaching, suggestion or motivation to combine the references, and (3) the references suggest a reasonable expectation of success. See MPEP §2142. See also In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991); In re Kotzab, 217 F.3d 1365, 55 USPQ2d 1313 (Fed. Cir. 2000).

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998).

If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

In the final Office Action, the Examiner stated that the Chung reference taught each of the limitations in independent claim 13 except for a process of depositing a film lubricant upon at least an outer surface of the swage boss. The Examiner however then concluded that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify a process of applying a lubricant to the swage ball by placing the lubricated swage ball in the swage boss to lubricate the swage boss for the purpose of reducing the force of friction or wearing either the swage ball or swage boss or both during a production operation. Chung is solely directed to providing a lubricated swage boss for reducing the forces imparted on the actuator which occur during swaging. Chung et al. is absolutely silent as to lubricating any other parts of the actuator assembly.

The presently claimed invention does not claim actual lubrication of the swage ball or the surfaces which come into contact with the swage ball; rather, the claimed invention relates to lubrication of those parts that do not come into contact with the swage ball, and are lubricated for not only the purpose of reducing contamination in a swage operation, but also for reducing torque out retention values in a subsequent de-swaging process. The Examiner's reasoning found in the final Office Action suggests the Examiner is not clear as to the components recited as being lubricated; the Examiner states that it would have been obvious to lubricate the swage boss by contact with the lubricated swage ball. As claimed in independent claim 13, the surface that is

claimed as being lubricated in the present invention is the outer surface of the swage boss that does not make contact with the swage ball. Therefore, the Examiner's reasoning with respect to the Chung reference simply does not describe the correct surface that is claimed as being lubricated in the method of claim 13.

Assuming the Examiner intends for the Chung reference to be applied so that it teaches lubrication of the outer surface of the swage boss, Appellant asserts there is still no teaching, suggestion or motivation within Chung to obviate the claims. Chung is more specifically directed to etching the swage balls to remove aluminum oxide, and then lubricating the swage balls in a lubricating system that is free of aluminum oxide, hard particles and contaminants. Each of the examples provided in Chung are simply descriptions of the manner in which swage balls are prepared by etching, and then lubricated. In order for Chung to be modified to obviate the invention as claimed in independent claim 13, not only does the reference need to contain some teaching, suggestion or motivation to do so, but also the reference must suggest a reasonable expectation of success. Appellant asserts that there is not a single sentence within the Chung reference that remotely implies lubrication of any other parts of the actuator assembly, and further that since there is no such teaching, there can be no reasonable expectation of success found within the Chung reference. If only the swage ball in Chung is lubricated, it is not possible to lubricate the outer surface of the swage boss because the swage ball never contacts the outer surface of the swage boss. Thus inherently, there is no expectation of success.

Since the Examiner has not combined references for the rejection of claims 13-15 and 18-21, Appellant must assume that either the Examiner takes *official notice* or relies on common knowledge for the proposition that the method is obvious for those limitations not expressly

found within the Chung reference. (MPEP Section 2144.03). Appellant recognizes that the rationale to modify or combine the prior art does not have to be expressly stated in the prior art; rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law. In re Fine, 837 Fed.2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988). In the present case however, the prior art of record does not fairly imply or suggest lubrication of any part or component other than the swage ball. Particularly in disk drives, it is common knowledge that the type and manner in which lubrication is used to assemble or disassemble components may actually contribute to contamination of the disk drive. Thus, for disk drives, simply providing lubrication to any part in the disk drive does not always achieve an advantageous result in terms of reducing contamination. Thus, absent the Chung reference having some teaching of lubricating other parts of the apparatus therein, reliance upon common knowledge or even specific knowledge within the field of disk drives does not result in a fair conclusion that other components should be lubricated.

Claim 14 depends from claim 13 and further includes the step of depositing a film lubricant on the opening in the distal end of the actuator arm prior to the attaching step of claim 13. The Examiner has not addressed the rejection of claim 14 by further reciting where within the Chung reference this feature is disclosed. For the same reasons as set forth above with respect to claim 13, claim 14 is allowable not only as a dependent claim, but also because the Chung reference simply fails to disclose lubrication of any parts other than the swage ball itself.

Claims 15 and 18-21 depend directly or indirectly from claim 13 and for the same reason as set forth above, should also be allowed.

B. Claims 16-17 rejected under Section 103 as being unpatentable over Chung et al. in view of Fisher et al.

The Examiner stated that Chung taught all of the limitations except the process of applying the lubricant by spraying or by vacuum deposition, and that Fisher taught a method of making a measuring instrument including a process of applying a lubricant between surfaces by either spraying or vacuum deposition. Claims 16 and 17 depend from claim 13; therefore, for the same reason set forth above, claims 16 and 17 should also be allowed. Furthermore, it is also noted in Fisher that the surfaces are lubricated to obtain desirable "adhesion" characteristics. ("In order to give good adhesion between the surfaces 25, 26 and the lubricant material, the lubricant material is applied in particulate form, for example, by spraying or vacuum deposition and not by causing a preformed body to adhere to either of the surfaces") (Col. 8, lines 63-67). Adhesion is defined as "steady or firm attachment"(Webster's Ninth New Collegiate Dictionary). Thus, Fisher teaches that lubrication is provided for purposes of maintaining attachment between adjacent surfaces. There is clearly no motivation to combine the teachings of Chung with Fisher to obviate claims 16 and 17. Lubrication in Chung is provided to prevent parts from maintaining firm attachment during swaging, i.e., not for "adhesion". With the combination of Chung and Fisher, there can be no reasonable expectation of success if one reference provides lubrication to prevent damage to parts in contact and the other reference provides lubrication so that parts in contact can remain attached (thereby increasing the potential for damage). At a minimum, the disclosure in Fisher is confusing because lubrication and adhesion are opposite concepts.

Filed concurrently herewith is an Amendment After Final that Appellant believes clearly places the claims in better form for consideration on Appeal. In the final Office Action, the

Examiner responded to Appellant's prior arguments by stating that the Examiner was unclear as to where the claimed outer surface of the swage boss was located. In the Amendment After Final, Appellant has amended independent claim 13 to further recite that the swage boss has an inner surface that contacts a swage ball during swaging, and an outer surface not contacted by the swage ball during swaging. This amendment to independent claim 13 should thereby clarify the Examiners concern as to what surface is being claimed as lubricated within claim 13. Attached hereto at Appendix B is a copy of the Amendment After Final.

IX. CONCLUSION

For the reasons given above, Appellant respectfully submits that Claims 13-21 are in a condition for allowance, and respectfully requests that the outstanding rejection be reversed.

Respectfully submitted,

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Date: 4/8/04

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APPENDIX A - Appealed Claims

(Withdrawn) In a disk drive of the type including at least one data disk, and an actuator assembly having an actuator arm connected to a suspension arm, the improvement comprising:

a lubricant film applied to selected swage contact surfaces wherein said lubricant film

- 5 helps to prevent failure of the metal components during swaging and de-swaging.

2. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film comprises a polymer.

3. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film comprises a fluorocarbon composition.

4. (Withdrawn) A disk drive, as claimed in Claim 2, wherein said lubricant film comprises a fluoroalkylmethacrylate.

5. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film comprises a solid film.

6. (Withdrawn) A disk drive, as claimed in Claim 5, wherein said lubricant film is produced from CHF₃ gas.

7. (Withdrawn) A disk drive as claimed in Claim 1, wherein:

5 said actuator arm includes a distal end and an opening formed in said distal end, said opening being defined by an inner surface, said suspension arm being connected to said actuator arm by a swage boss extending from a swage plate attached to said suspension arm, said sage boss being swaged with said opening, and wherein said selected swage contact surfaces include at least one of said opening and an outer surface of said boss.

8. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant polymer film is applied up to a thickness of 2700 angstroms.

9. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is a monolayer.

10. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is applied by immersing the selected swage contact surfaces in a dilute solution of the lubricant film, and draining the solution from said swage contact surfaces or raising the selected swage contact surfaces out of the solution at a desired rate.

11. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is deposited upon said swage contact surfaces by a vacuum deposition process.

12. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is deposited on said swage contact surfaces by spraying.

13. (Currently Amended) A method of assembling an actuator assembly of a disk drive, said method comprising the steps of:

providing an actuator arm having a proximal end and a distal end;

providing a suspension arm having a proximal end and a distal end;

5 fixing a swage plate to the proximal end of the suspension arm, said swage plate including a swage boss extending therefrom, said swage boss having an inner surface that contacts a swage ball during swaging, and an outer surface not contacted by the swage ball during swaging;

depositing a film lubricant upon at least the outer surface of said swage boss; and

attaching the suspension arm to the actuator arm by swaging the swage boss to an opening
10 formed in the distal end of the actuator arm.

14. (Original) A method, as claimed in Claim 13, further including the step of:

depositing a film lubricant on the opening in said distal end of the actuator arm prior to said attaching step.

15. (Original) A method, as claimed in Claim 13, wherein:

said film is deposited upon the swage boss by immersing the swage boss in a dilute solution containing the film lubricant, and then draining the solution at a selected rate or raising the swage boss out of the coating solution at a desired rate.

16. (Original) A method, as claimed in Claim 13, wherein said film lubricant is deposited upon the swage boss by spraying.

17. (Original) A method, as claimed in Claim 13, wherein said film lubricant is deposited upon the swage boss by vacuum deposition.

18. (Original) A method, as claimed in Claim 13, wherein said film lubricant is a polymer film.

19. (Original) A method, as claimed in Claim 13, wherein said film lubricant is a solid film.

20. (Original) A method, as claimed in Claim 18, wherein said polymer comprises fluorocarbon.

21. (Original) A method, as claimed in Claim 19, wherein said solid film comprises fluorocarbon.

22. (Previously Presented) A method of reducing torque out retention values between an actuator arm and a suspension arm of a disk drive which are connected by swaging, said method comprising the steps of:

providing swage contact surfaces including an outer surface of a swage boss; and

5 applying a lubricant film coating to said outer surface, thus providing lubrication in a
subsequent de-swaging process.

23. (Original) A method, as claimed in Claim 22, wherein:

said lubricant film coating is applied to said swage contact surfaces by immersing said swage
contact surfaces in a dilute solution containing the lubricant film coating, and then draining the
solution or raising the swage contact surfaces out of the lubricant film coating solution at a selected
5 rate.

24. (Original) A method, as claimed in Claim 22, wherein said lubricant film coating is
applied to said swage contact surfaces by spraying.

25. (Original) A method, as claimed in Claim 22, wherein said lubricant film coating is
applied to said swage contact surfaces by a vacuum deposition process.

26. (Original) A method, as claimed in Claim 22, wherein said film lubricant is a polymer
film.

27. (Original) A method, as claimed in Claim 22, wherein said film lubricant is a solid
film.

28. (Original) A method, as claimed in Claim 26, wherein said polymer film comprises fluorocarbon.

29. (Original) A method, as claimed in Claim 27, wherein said solid film comprises fluorocarbon.

30. (Withdrawn) In a disk drive of the type including at least one data disk, and an actuator assembly having an actuator arm connected to a suspension arm, the improvement comprising:

means applied to selected swage contact surfaces of the actuator arm and suspension arm for lubricating said surfaces to reduce material failure of said contact surfaces during de-swaging.

5 31. (Previously Presented) A method, as claimed in Claim 22, further comprising the steps of:

providing an inner surface defining an opening in a distal end of the actuator arm; and

applying a lubricant film coating to said inner surface thus providing lubrication in the

5 subsequent de-swaging process.